ATTACHMENT A:

SUPPORTING DOCUMENTATION FOR NPDES PERMIT RENEWAL

Contents

1.0 Introduction

P.J. Keating Company owns and operates an earth products processing facility in the town of Acushnet, Massachusetts. The facility is a leading supplier of crushed stone, ready-mix concrete, bituminous concrete, and construction sand and gravel. The site is located on roughly 200 acres just east of South Main Street and north of Tootle Lane (see Figure 1 Site Locus Plan). This attachment contains data and information supporting the facility's NPDES Individual Permit application for the discharge of process wastewater (Form 2C) and stormwater associated with industrial activity (Form 2F).

Principal operations at the site include: removing overburden; trap rock quarrying; stone processing; and batch processing of hot-mix asphalt (i.e., bituminous concrete). The facility is not engaged in the production of cement or asphaltic emulsions.

Material necessary for the above operations is mined from the quarry and conveyed via large trucks to one of the two stone processing facilities. All stone material is crushed to a maximum diameter of 4 inches and separated by a series of sieves according to size. A portion of the stone is then further crushed into sand and washed with water pumped from on-site settling basins. Effluent from the process is discharged into settling ponds. The final products are then stored on-site until sold or used at the on-site asphalt or concrete plants. Silt material dredged from the settling basins is stored along the eastern edge of the property. The site also contains vehicle wash racks, a vehicle-fueling station, a maintenance garage, and office space.

P.J. Keating does lease some of its land to L&S, a readi-mix concrete batch processing facility. The readi-mix concrete batch processing facility and related equipment are owned and operated by L&S, a separate company. General information about concrete facility discharges is included in this attachment for water balance purposes. Although the concrete facility discharges are not subject to the control of P.J. Keating, such discharges are included in this permit application submittal.

Depending on local weather conditions, full-scale processing operations typically extend from March 15th through December 31st. In general, major processing operations at the facility are conducted 5 days per week, 12 hours per day during the spring, summer and fall. Occasionally, to accommodate short-term delivery schedules, the facility will operate 7 days per week, 24 hours per day. Although the facility continues to function as a supplier of earth products and concrete during the winter (i.e., earth products from available stockpiles), major processing operations are significantly curtailed due to freezing temperatures. Operations typically suspended include: trap rock quarrying; stone processing; and batch processing operations at the asphalt plant.

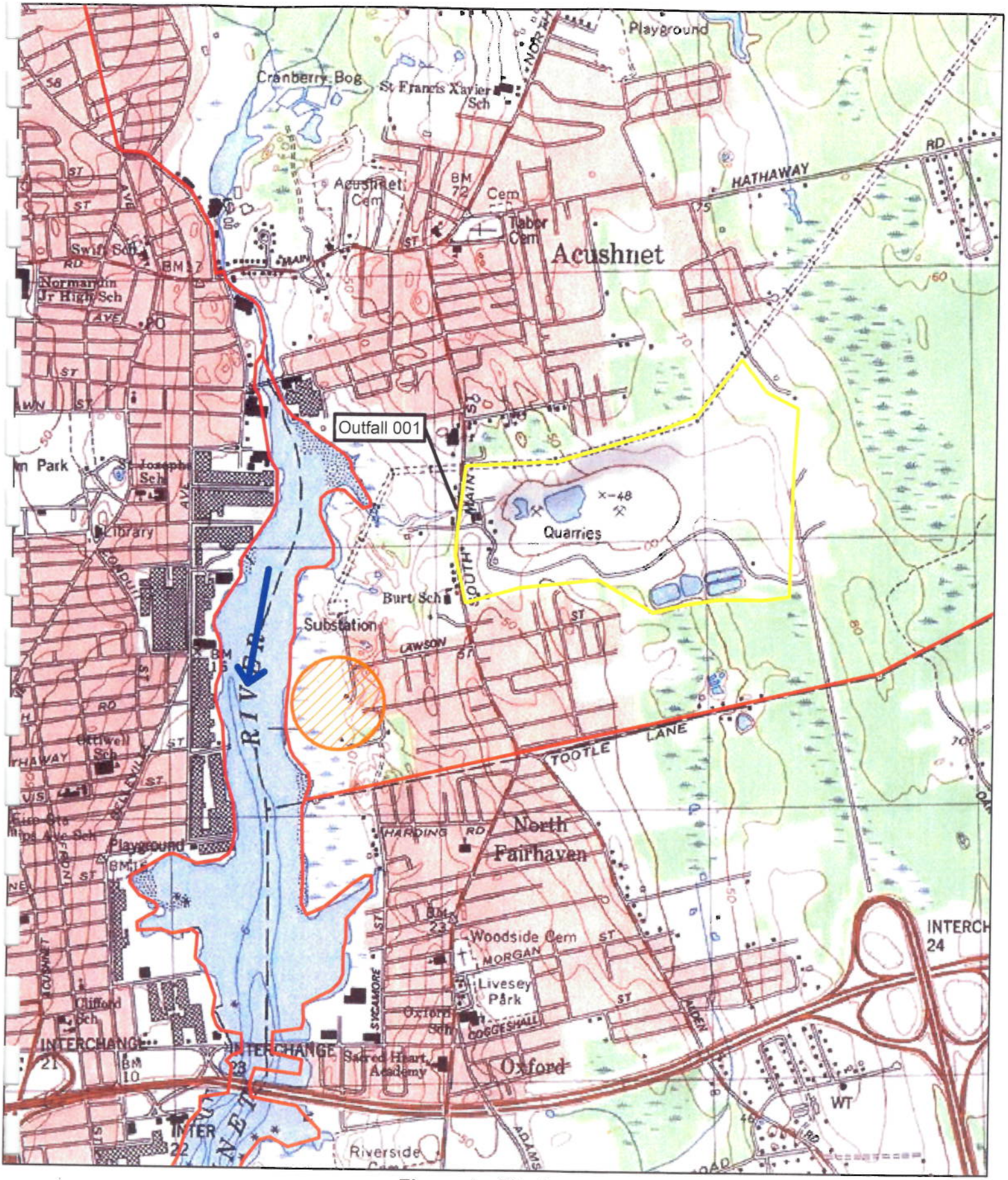

Figure 1 - Site Locus
P.J. Keating Individual NPDES Permit Application

Source: USGS Topographic Quadrangle (1:24,000)

0 750 1,500 3,000
Feet

7 eg54'13"W 41deg40'26"N

- Town Boundary
- Approximate Site Boundary
- Flow Direction
- Inactive, Uncapped, Unlined Landfill

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2.0 Site Layout

A layout plan for the facility is attached (see Figure 1 Site Locus PlanLayout). This figure identifies key processing areas of the facility, stockpile areas, settling basin locations, outfall location and watershed, and significant materials storage/handling areas.

Stormwater runoff from areas located away from major processing operations is conveyed via sheet flow to surrounding woodlands, Outfall 001 (a discharge point); active gravel pits and/or storage ponds; stormwater on the site also infiltrates and/or evaporates.

3.0 Water Balance Diagram

A water balance diagram for the facility is shown in Figure 3. Flow rates listed depict estimated wastewater discharge requirements associated with truck washing, readi-mix concrete production, bituminous concrete production, stone washing and stone plant operations under typical summer operating conditions. Other than for evaporative losses and retention losses in the lightweight aggregate storage area, discharge volumes for each process closely approximate process water supply requirements. Some variation in flow rates from individual operations can be expected with variations in facility production schedules.

The bulk of the facility's process makeup requirements are satisfied through surface water withdrawals from the on-site tertiary settling basins (Pond 1A, 1B and Pond 2C). As shown on the facility's water balance diagram, operation of Primary Settling Basins (Pond 1A and Pond 2A), Secondary Settling Basins (Pond 1B and Pond 2B), and tertiary Settling Basins (Pond 1C and 2C) allows for recycle/reuse of water from the facility's principal production areas: the stone plant and the asphalt batching plant.

Water discharged from the site via Outfall 001, infiltration over pervious surfaces, and/or evaporation is replaced through direct rainfall and/or stormwater runoff. Potable water for the QA/QC lab and main office is obtained from the municipal water source. Water from Pond 1A is used for non-contact cooling water at the Stone Processing West Crushers, Sand Screw and Wash Plant.

Wastewater is generated primarily from the stone processing/ washing operations. Secondary sources include: vehicle washing, various dust control processes, concrete production, and equipment washing operations. Prior to off-site discharge or on-site recycle/reuse, all process wastewater is treated via settling of suspended solids. Crushed stone rinsing operations are performed on an as needed basis for quality control purposes. Process water from this operation (from Stone Processing Crushers-East) is sent to a slope plate clarifier ("Mud Sucker'). Waste water from the clarifier is discharged to a settling pond with two cells. Clean water from the clarifier is recycled for further stone washing.

All sanitary wastewater is discharged to subsurface disposal systems serving individual processing areas of the site.

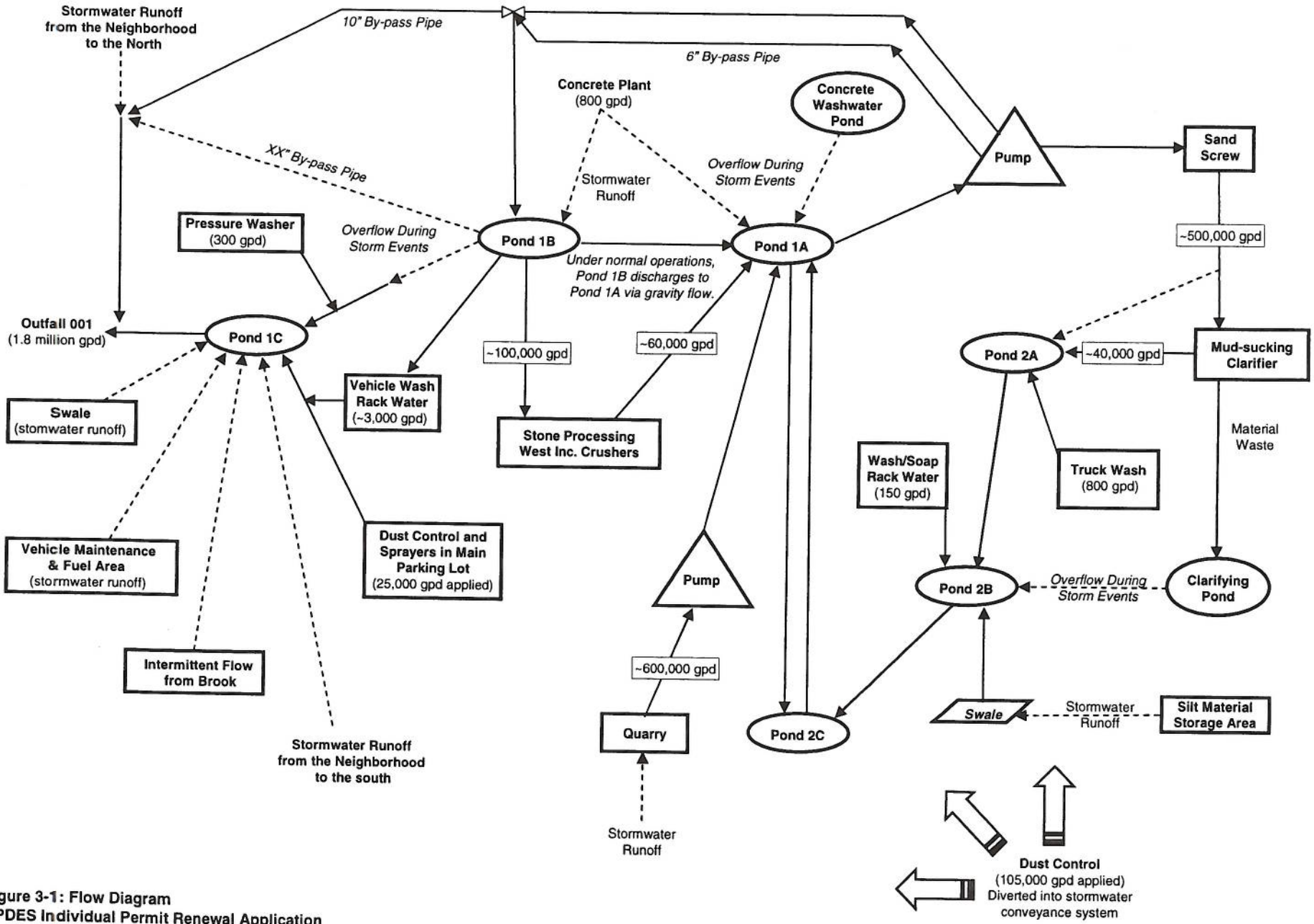

Figure 3-1: Flow Diagram
NPDES Individual Permit Renewal Application
P.J. Keating Company

4.0 Process Wastewater Generation/ Disposal

Estimated process wastewater generation and disposal requirements in each of the facility's production areas is briefly described below. Water use and wastewater generation volumes for individual waste streams vary with facility production schedules.

4.1 Stone Processing Plant Dust Control

Water is used at the stone plant for dust control purposes. The stone plant is equipped with water nozzles and sprayers for all high dust areas, including the rock crushers. Screening towers are enclosed and equipped with baghouses. Selected conveyers and discharge points are equipped with strategically located spray nozzles to minimize dust emissions during stockpiling operations.

Stone rinsing occasionally takes place in an area of the plant (the water truck fill area) separate from the stone washing area. Rinse water from this operation is conveyed to Pond 1A.

4.2 Stone Wash (Wash Plant)

Crushed stone rinsing operations are performed on an as needed basis for quality control purposes. Estimated water use and wastewater disposal requirements are projected based on a 50 gpm flow rate over a fifteen-minute period with water generated from this product is sent to a slope plate clarifier ("Mud Sucker'). Waste water from the clarifier is discharged to Pond 2A. Waste material from the clarifier is conveyed to the Clarifier Pond which includes two cells. Once one of the Clarifier Pond's cells is filled, it is then allowed to dry out and the material is sold.

4.3 Quarry Dewatering

Water, which accumulates in the quarry due to either groundwater inflow or rainfall, collects in the Quarry Detention Area and is pumped out and discharged to Pond 1A. Quarry dewatering typically averages 0.5 – 0.6 mgd, depending on weather conditions.

4.4 Vehicle Washing

The vehicle wash station is used for the cleaning of on- and off-road vehicles. The vehicle washing area is equipped with spray nozzles to rinse dust from vehicle windshields, bodies and tires. The vehicle wash station typically handles 100 vehicles per day. Average water use per vehicle is estimated to be 50 gallons. Wastewater discharge from truck washing and crushed stone rinsing operations is conveyed via overland flow captured by a catch basin and piped under the road to Pond 1C.

Some truck washing operations are also conducted adjacent to the vehicle maintenance garage at the Pressure Washer. Similarly, gravel trucks are sometimes washed near Pond 2A with water pumped from the pond. The station typically handles 12 vehicles per day. Average water use per vehicle is estimated to be 800 gallons.

4.5 Asphalt Plant Baghouse Catch

The asphalt batching plant is equipped with an air emissions dust control system (i.e., baghouse) to capture fugitive dust associated with stone drying operations. Dust from the baghouse is captured within the processing drum and mixed into the asphalt during production. There is no discharge of wastewater from this process.

4.6 Concrete Plant – L&S

Wastewater at the concrete plant originates from equipment and truck cleaning operations performed prior to off-site shipment. Cleaning operations are performed to prevent the inadvertent buildup and hardening of concrete on truck bodies and appurtenant equipment. Cleaning operations typically require 10 to 20 gallons per vehicle. Based on an average use rate of 15 gallons per vehicle and processing of 50 vehicles per day, the estimated wastewater generation rate is 750 gpd.

The concrete facility currently uses a small constructed pond as a water recycling area (indicated on Sheet 2 as Concrete Waste Water Pond). Trucks back up near the pond and use hoses to clean out the interior of the concrete trucks and appurtenant equipment. The water then runs via overland flow to the small settling pond where it is captured until it is reused. Any overflow from the Concrete Waste Water Pond flows to Pond 1A. The waste water pond is cleaned out weekly, or as necessary to remove accumulated sediment and concrete wash-off, to ensure sufficient water storage volume.

A concrete block forming area is located next to the concrete facility (adjacent to the wash out pond). Excess concrete (i.e., ready-mix concrete returned to the facility) is poured into molds to form concrete blocks. These blocks have been used on-site as a construction material for the aggregate storage area. They are also sold for a variety of off-site purposes. Discharge from the molding operation, estimated at less than 50 gallons per day, will also be conveyed via overland flow to the Concrete Waste Water Pond.

5.0 Additives

This section provides a brief description of process additives used at the facility which, through proper use and handling, may come in contact with direct precipitation or discharging wastewater. These products are not stored in a manner that allows for direct contact with rainfall.

5.1 Liqui-Slip

P.J. Keating uses an environmentally safe, biodegradable asphalt release agent (trade name Liqui-Slip) as a truck bed liner prior to asphalt loading. This product is required to prevent asphalt from hardening or sticking in the truck bed during transport. Liqui-Slip was developed to eliminate the need for coating truck beds with diesel fuel. Keating uses this product for all company owned vehicles and provides it, free of charge, to all outside haulers.

Liqui-Slip has a thickened cold-cream like consistency which does not run or form puddles. As such, less product is required compared to fuel oil or other release agents. Care is taken during application to prevent over spray. Product data and a material safety data sheet for Liqui-Slip is included in Attachment C.

5.2 Drufloc 260

PJ Keating uses Drufloc 260 as a floculant to increase the settling rate of suspended solids in the ponds following the slope plate clarifier (Pond 2A and Clarifier Pond). The additive speeds up the settling process, thereby allowing PJ Keating to sell of the settled material. Drufloc 260 is a white, free flowing powder. Product data and a material safety data sheet for Drufloc 260 is included in Attachment C.

5.3 Concrete Truck Cleaning Agents (L&S)

Most truck cleaning operations at the facility are performed using simple low- and high-pressure water spray systems. Concrete mix trucks do, however, require periodic washing with detergents to remove accumulated dust, dirt or concrete. Cleaning will be performed at the Concrete Waste Water Pond.

The concrete facility may also use a product to act as a wetting agent that clings to the surfaces being cleaned. Application of this product(s) increases wetting time and prevents rapid drying and runoff of liquid cleaning solutions, thereby reducing the amount of solution required for cleaning.

A cleaning solution may also be used to dissolve hardened concrete, when necessary, from truck bodies/equipment.

Both products are applied in accordance with manufacturer's guidelines. Product data and a material safety data sheets are maintained at the concrete facility.

6.0 Description of Settling Basins

6.1 Quarry

Dewatering water and stormwater in the rock quarry is collected in the Quarry Detention Area fitted with a 1,400-gpm pump. This pump automatically switches on at regular intervals, dewatering the pit to a set level. Discharge water is pumped to Pond 1A. During storm events, the rock quarry pit serves as a storm water detention pond, transferring a controlled discharge volume of stormwater to Pond 1A.

6.2 Pond 1A

Pond 1A has a surface area of approximately 2.7 acres and an average depth of 40 feet. Discharge from the basin is conveyed to Pond 1B and Outfall 001 via underground piping. In addition to quarry discharges the basin receives overland flow from the surrounding area (refer to Site Layout Plan). Pond 1A is never dredged due to its great depth and the relatively clean water discharged to it. A by-pass pipe was recently installed from Pond 1A around Pond 1B and discharging to the stream upgradient of Outfall 001; this pipe allows clean water from Pond 1A, which is mostly quarry dewatering water, to be discharged directly to Outfall 001 (via an intermittent stream) thereby providing additional treatment capacity within Pond 1B and 1C.

6.3 Pond 1B

Pond 1B is approximately 0.1 acres and 10 feet deep. Under normal operating conditions, Pond 1B generally discharges back to Pond 1A via gravity flow to provide further recycling of water. Once the pond reaches a certain elevation or the valve on the discharge to Pond 1A is closed, the water discharges to Pond 1C. A valve can be opened redirecting the discharge to the intermittent stream upstream of Outfall 001. This water is redirected during periods of highflows to allow increased settling times within Pond 1C since the water within Pond 1B is relatively clean. Water from the basin is also recycled for use at the Vehicle Wash Rack and stone processing plant (Stone Processing West Crushers).

Pond 1B is dredged as needed. Excavated material is allowed to drain by gravity adjacent to the basin. Once drained, it is stored in the Silt Material Storage Area.

6.4 Pond 1C

Pond 1C has a surface area of approximately a 0.1 acres and an average depth of 8 feet. A series of stone berms traverse the basin. Water which has filtered through the stone berms eventually filters through the final berm and discharges to a drainage swale at Outfall 001. Recently installed silt curtains within Pond 1C also filter fines in the water passing through the curtains. In addition to overland flow from the residential neighborhood to the north, stormwater runoff, and water applied to control dust; the basin receives water from the Pond 1B, the pressure washer, and intermittent flow from the neighborhood and stream to the south of the property.

During periods of high flows, a valve installed along the Pond 2C return line, allows PJ Keating to redirect flows to Pond 1C.

The estimated tributary area to Outfall 001 is 174 acres, of which approximately 8 percent or 3.7acres is impervious. The estimate of impervious surface area does not include settling basin areas or the rock quarry. All roads were included as impervious area, whether paved or hard packed material. The rock quarry was omitted from the impervious area estimate since it acts as a flood control mechanism/detention pond (i.e., via the high level outlet) to skim peak runoff rates.

6.5 Pond 2A

Pond 2A is approximately 0.5 acres in area with an average depth of 8 feet. A culvert controls discharge from the basin. The discharge is conveyed to Pond 2B,

The basin receives direct discharge from the clarifier, overland flow and surface runoff from the asphalt plant.

Sediment depth in the basin is visually monitored on a daily basis. Recently installed silt curtains within Pond 2A filter fines in the water passing through the curtains. Dredging is typically performed on an as needed basis. Dredge spoils are piled in Silt Material Storage Area and allowed to dewater via gravity.

6.6 Pond 2B

Pond 2B has a surface area of approximately 0.1 acres and estimated average depth of 8 feet. A high level outlet allows for discharge to Pond 2C. Pond 2B occasionally receives stormwater inflow from the immediate surrounding area, including the silt material storage area which first flows through a swale. Pond 2B also receives any overflow from the Clarifier Pond and from the Wash/ Soap Rack. A silt curtain at the pond's midpoint filters out fines in the water prior to its discharge to Pond 1C.

6.7 Pond 2C

Pond 2C serves primarily as a recirculation basin for process make-up water. The pond is approximately 1.3 acres with 8 feet of depth. Because of available detention time within the primary (2A) and secondary (2B) basins, water in the basin is suitable for recirculation/reuse without further treatment. A pump house is located at the upstream side of the basin.

7.0 Significant Materials Storage and Handling Practices

Facility operations require the handling and storage of significant materials. The facility has, however, implemented a variety of structural and non-structural controls to prevent significant materials from coming into direct contact with rainfall or stormwater runoff.

Significant materials storage and handling practices within each basin are described below.

7.1 Fuel Storage Area

The facility maintains two below ground fuel storage tanks – one 8,000 gallon and one 4,000 gallon in the maintenance garage vicinity.

The refueling station serves only company owned vehicles. Fuel is delivered by tanker truck. In accordance with regulatory requirements, all fuel loading and unloading operations are supervised by maintenance personnel.

When in use, the above ground tank, lines, and valves are inspected daily for signs of spills or leaks. Below ground tanks are pressure tested annually. If a leak is detected in any tank, the contents of the tank would be removed and the tank would be taken immediately out of service, repaired, and/or removed. Speedi-dry is available at the maintenance garage for use in cleaning up small spills or leaks during refueling operations.

Smoking is prohibited during all refueling operations.

7.2 Natural Gas

Natural gas is used during the winter at several on-site structures. In addition to heating the plant, natural gas is also used to heat water for concrete production during the winter.

7.3 Vehicle Maintenance/Waste Oil Storage

The facility operates approximately 50 on- and off-road vehicles. Vehicle maintenance operations are performed within the on-site garage. Drip pans are used for draining all fluids. Any spills or leaks are cleaned up using Speedi-dry. The buildings do not contain floor drains.

Waste oils from vehicle maintenance operations are temporarily stored in an above ground storage container located inside the maintenance garage. This waste oil is subsequently transported off-site by an appropriately licensed waste hauler (i.e., Clean Harbors), for off-site treatment and disposal.

Cleaning agents and solvents are all stored inside the maintenance garages and not combined with waste oil. ZEP Dyna Brute Parts Cleaning Stations are used at the two on-site garages. These stations recycle the solvent, eliminating solvent disposal.

7.4 Vehicle Washing

The site has four onsite wash stations as listed below.

Vehicle Wash Rack - The truck wash rack is a high-pressure 180-degree spray unit used to rinse dust from vehicle windshields and bodies. The vehicles drive under the rack, the system is activated by sensing the truck and rinses the vehicle to remove dust and material prior to exiting the facility.

Pressure Washer - The high-pressure spray at the pressure wash station near Pond 1B is also used for rinsing truck beds and dust from vehicle windshields and bodies. On occasion, the station is also used to rinse gravel and crushed stone prior to off-site delivery. Crushed stone rinsing operations are performed on an as needed basis.

Body Truck Wash - The body truck wash is located at Pond 2A. Effluent from this operation enters Pond 2A.

Asphalt Plant Wash/Soap Rack - Soap (foam) is added to the beds of the trucks before they are loaded with asphalt (it is diluted with water).

As previously indicated, water use and wastewater generation volumes for individual waste streams vary with facility production schedules.

7.5 Stone Processing

The principal use of water at the stone plant is for stone washing operations which are performed prior to offsite transport. Effluent from Stone Processing East facility is collected by a slope plate clarifier. Drufloc 260 is introduced in the wastewater at the clarifier via a timer and pump, adjusted as necessary by plant personnel. This polymer decreases the settling time in the ponds. Effluent from the Western Stone Processing Facility is collected and conveyed to Pond 1A.

Water is also used at the stone plants for dust control purposes. The stone plants are equipped with a dust control system for all high dust areas. Rock crushers are equipped with spray bars and spray nozzles. Screening towers are enclosed and equipped with baghouses. Conveyor belts, used for materials transport, are equipped with strategically located spray nozzles to minimize dust emissions during stockpiling operations.

7.6 Ready-Mix Concrete (L&S)

Cement is delivered to the facility by trucks. It is unloaded using a pneumatic system equipped with a baghouse to control particulate emissions. Cement is stored in a silo located adjacent to the concrete plant.

Admixtures for concrete are used to enhance the properties of ready-mix concrete. Admixtures are unloaded under the supervision of facility personnel and stored in totes located inside the concrete plant. All tanks, lines, and valves are inspected by the concrete plant foreman.

7.7 Fertilizers

Fertilizers are occasionally applied in the immediate vicinity of the main office. All fertilizer applications are performed by a contracted landscaping firm in accordance with manufacturer's recommendation. Fertilizers are not stored on-site.

7.8 Liquid Asphalt

Liquid asphalt is delivered to the facility by tanker truck. It is stored in three above ground 20,000-gallon storage tanks located at the asphalt plant. The area is equipped with secondary containment. All unloading operations are performed under the supervision of facility personnel.

The asphalt plant foreman visually inspects tanks, lines and valves for leaks or spills on a daily basis.

7.9 Dryer Heating Fuel

Number 2 fuel oil and/or specification used fuel oil are used to heat the aggregate dryer at the asphalt plant. These fuels are delivered to the facility by tanker truck. Fuels are stored in above ground tanks located in the containment area in front of the asphalt plant. Two tanks are currently in use; a 3,000-gallon tank and a 15,000-gallon tank. A 300-gallon heating oil tank is also located at the asphalt plant for storage of pilot fuel for the dryer (i.e., generally used to preheat the system).

All tanks, piping and valves are visually inspected on a daily basis for the presence of leaks or spills.

8.0 Additional Controls

In addition to dust control measures outlined for individual processing areas of the site, the facility has also implemented site wide dust and erosion and sediment control measures to minimize environmental impacts. These include use of earthen and gravel berms around selected material stockpile areas and use of a water truck to wet down on-site roads. Earthen or gravel berms have been used on-site to reduce overland flow velocities, limit the potential for sediment migration to the immediate vicinity of a stockpile area, and maximize infiltration. Wetting down on-site roads minimizes the amount of dust generated by vehicle traffic as well as the transport and deposition of sediment on surrounding public roadways.